

SERVICE MANUAL

ATRIA 3100

ATRIA 6100

PART NUMBER 70-00083-01 A



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This document contains instructions for both the Atria 3100 and Atria 6100.

TO RESPONSIBLE SERVICE PERSONNEL:

The contents of this document are not binding. If any significant differences between the product and this document are encountered regarding service work, contact Cardiac Science Corporation for more information.

Cardiac Science Corporation recommends the use of authorized Cardiac Science Corporation personnel for the maintenance and repair of all Burdick equipment. Cardiac Science Corporation cannot warrant the operation of the equipment if other than Burdick genuine replacement or exchange parts are used in the service or repair of this equipment, and if such service or repair is performed by non-authorized personnel.

This product has been carefully designed to provide a high degree of safety and dependability. However, we can not guarantee against the deterioration of components due to aging and normal wear.

CAUTION — The Atria electrocardiograph is a restricted device. Federal law restricts the sale, distribution, or use of this device to, by, or on the lawful order of a health professional.

DANGER — Explosion hazard. Do not use this device in the presence of flammable anesthetics.



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Contents

Chapter 1: General Information

About the Atria Electrocardiographs	1-1
System Description	1-1
Technical Specifications.....	1-2

Chapter 2: Service & Maintenance

When to Perform Service Procedures	2-1
Functional Checkout	2-2
Required Equipment.....	2-2
Functional Checkout Procedure.....	2-2
Calibration Pulse Check Procedure.....	2-4
Electrical Leakage Current Tests	2-4
Required Equipment.....	2-4
Patient Leakage Current Procedure	2-5
Patient Sink Current Procedure	2-5
Queue Sensor Calibration.....	2-6
Calibration Procedure	2-6

Chapter 3: Troubleshooting

Preliminary Checks.....	3-1
Troubleshooting Chart	3-2

Chapter 4: Component Replacement

Parts List	4-1
Component Replacement	4-6
Replace the Top Cover Assembly	4-6
Replace the Paper Drive Assembly.....	4-7
Replace the Atria 3100 Mainboard (including Modem)	4-8
Replace the Atria 6100 Mainboard (including Video Adapter Board and Modem)	4-9
Replace the Power Supply Board	4-10
Replace the External Power Supply	4-11

Disassembly	4-12
Remove the Battery Pack.....	4-12
Remove the Atria 3100 Top Cover Assembly.....	4-14
Remove the Atria 6100 Top Cover Assembly.....	4-15
Remove the Paper Drive Assembly	4-17
Remove Atria 3100 Mainboard Assembly.....	4-18
Remove Atria 6100 Mainboard Assembly.....	4-20
Remove Power Supply Board	4-22
Remove the Paper Door	4-23

1 General Information

What's in this chapter

- ◆ [About the Atria Electrocardiographs](#) 1-1
- ◆ [System Description](#) 1-1
- ◆ [Technical Specifications](#) 1-2

About the Atria Electrocardiographs

The Atria electrocardiograph is a multichannel electrocardiograph with a thermal printer. Options may include ECG interpretation and modem or network connectivity.

System Description

The Atria has the following main subsystems:

- ◆ Mainboard contains the host and front end. The video adapter board (Atria 6100 only) and optional modem plug directly into the mainboard.
- ◆ Power Supply Board: Receives input power from the external power supply or battery pack, supplies power to the Atria, and recharges the battery pack when connected to external power.
- ◆ Paper Drive Assembly: Includes the printhead, queue sensor to correctly position the paper, and the paper drive motor to feed the paper.
- ◆ The Top Cover Assembly: Contains the keyboard and video display.

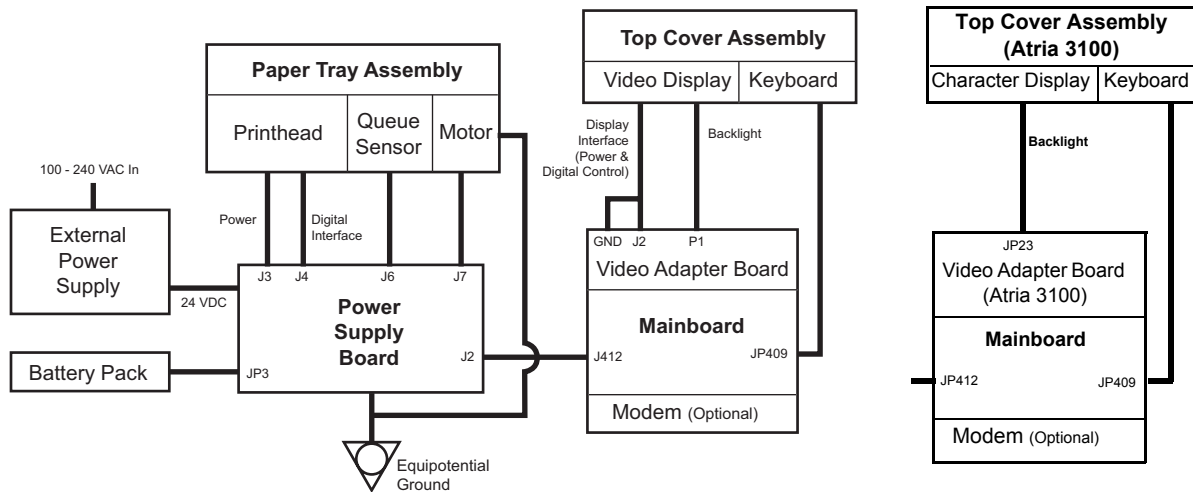


Figure 1: Atria Subsystems

Technical Specifications

Specification	
Dimensions	15.0" x 13.125" x 5.5" (381mm x 334mm x 140mm)
Weight (unit only)	11 lbs (5 kg) (including external power supply)
Display	Atria 3100: 2 x 40 character backlit LCD screen Atria 6100: 640 x 480 backlit color LCD screen
Keyboard	Full alphanumeric keypad plus designated quick keys
Data Storage	Atria 3100: 50 records standard Atria 6100: 150 records standard, optional upgrade to 300
Input Power	AC Operation 100-240 VAC \pm 10%, 50-60 Hz \pm 3 Hz
Battery duration	55 minutes continuous printing
Printout	
Printout device	216 mm thermal dot array
Paper dimension	8.5" x 11" (US letter) 210mm x 300mm (A4)
Paper type	Thermal sensitive (Burdick Assurance® or HeartLine™ paper recommended)
Chart speeds	12.5, 25, 50 mm/sec

Specification	
Gain	5, 10, 20 mm/mV Chest or Limb (may be split)
Printout formats	3, 4, 6 or 12 channels; additional rhythm formats
Acquisition	
Lead selection	I, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6 and Alternate Chest Lead (chest lead selection V2R through V9R, V7, V8, and V9)
Modes	Automatic, automatic rhythm, or manual rhythm
Frequency response	Meets or exceeds ANSI/AAMI EC11-1991 and IEC 60601-2-51 standards
Input impedance	Meets or exceeds ANSI/AAMI EC11-1991 and IEC 60601-2-51 standards
Electrode offset tolerance	±300 mV
Sampling	8000 Samples/Sec. 2.5µV LSB
Artifact filter response	40 Hz, -3db
Storage	500 samples/second, 2.5µV LSB
Pacemaker display capability	Meets or exceeds ANSI/AAMI EC11-1991 standard and IEC 60601-2-51
Interpretation (optional)	Diagnosis, measurements, reasons statements based on five demographic criteria
Environmental	
Operating temperature	50°F to 104°F (10°C to 40°C)
Operating relative humidity	20% to 75% non-condensing
Operating atmospheric pressure	1060 hPa to 700 hPa (-500 ft to 10,000 ft reference to sea level)
Storage temperature	-4°F to 113°F (-20°C to 45°C)
Storage relative humidity	10% to 90% non-condensing
Storage atmospheric pressure	1060 hPa to 190 hPa (-500 ft to 40,000 ft reference to sea level)
Harmful Ingress of Water	Normal
Input/Output (Units with communications)	
	Ethernet (RJ45)
	USB type A
	Standard RS-232 (9 pin D)

Specification

	Analog output (3.5 mm phono plug)
Optional Upgrades	802.11
	Bluetooth
	Telephone line interface (RJ11)
Conforms to Standards	CAN/CSA-C22.2 No. 0-M91 CAN/CSA-C22.2 No. 601.1-M90 CAN/CSA-C22.2 No. 601.1S1 CSA C22.2 No. 601.2.25 UL 60601 EN 60601-1 EN 60601-2-25 & Amend. 1 EN 60601-1-2 AZ/NZS 2064.1/2 ANSI/AAMI EC11 - 1991 EN 60601-2-51
Safety	
Leakage current	patient <10 μ A, chassis <100 μ A
Defibrillation protection	to 5000V, 360J
Equipment Type	Class IIa (Council Directive 93/42/EEC, MDD)
Degree of protection from electric shock	IEC 60601-1 Class II, Type CF - Defibrillator Proof
Mode of operation	Continuous
Schematics	Available on request
Warranty	3 years with return of warranty card

2 Service & Maintenance

What's in this chapter

- ◆ [When to Perform Service Procedures](#) 2-1
- ◆ [Functional Checkout](#) 2-2
- ◆ [Electrical Leakage Current Tests](#) 2-4
- ◆ [Queue Sensor Calibration](#) 2-6

When to Perform Service Procedures

Perform the following procedures as indicated:

- ◆ [Functional Checkout](#) on page 2-2: Used to verify normal operation. Must be performed before returning the Atria to the user.
- ◆ [Electrical Leakage Current Tests](#) on page 2-4: Used to verify Atria electrical safety. Must be performed after any internal repair (i.e., the case is opened), or to check for possible damage (e.g., the Atria is dropped).
- ◆ [Queue Sensor Calibration](#) on page 2-6: Used to ensure paper feeds correctly. Must be performed if:
 - The paper tray assembly is removed or replaced
 - The queue sensor board is replaced
 - The power supply board is replaced
 - The mainboard is replaced.

Functional Checkout

Use this procedure to verify normal operation before returning the Atria to the user.

Required Equipment

- ◆ Patient Simulator

Functional Checkout Procedure

If necessary, turn off the Atria and disconnect the AC power cord.

1. Plug the AC power cord into a wall outlet. Wait until **PRESS ON/STBY** to power on the unit displays on the **Battery Charging** screen.
2. Press the **ON/STBY** key to power on the Atria. Verify the Atria boots up to the **Home** screen without errors.
3. Remove any paper, if installed, and note the printhead resistance in the battery compartment.
4. Select **Setup | Service Functions | Printhead Resistance** and verify the resistance matches the printhead resistance label in the battery compartment.

Note: If the mainboard is replaced, the printhead resistance must be re-entered.

If the paper tray assembly is replaced, a new printhead resistance must be entered and the label in the battery compartment must be changed (both should match the printhead resistance written on the printhead).

5. Reinstall the paper and verify the paper type matches the type selected in **Setup | System | Paper Type**.
6. Select **Setup | Service Functions | Printer Test Sequence**. The Atria prints 3 pages of test characters. Verify all characters print evenly across the page.
Note: The test characters may appear lighter or darker, depending on the type of paper used, but the printing should still be clear and even across the page.
7. Press the **HOME** key.
8. Turn on the patient simulator.

9. Connect the patient simulator to the Atria.
On the **Home** screen, verify:
 - The patient name and ID number or **No Name, (No Id)** display**Note:** The patient name and ID number display when patient demographic information has already been entered.
 - For the Atria 3100: **FAIL, DRIFT, or NOISE** messages do not display
For the Atria 6100: **SENSORS OK** message displays
 - **AC** displays
10. Disconnect the AC power cord for 1 minute and verify the Atria continues to operate normally (**AC** will change to **BAT**).
Note: If the Atria shuts down immediately after disconnecting the AC power, ensure the battery is installed and securely connected.
11. Reconnect the power cord and verify **BAT** changes back to **AC**.
12. Press the **ECG** key to acquire and print out an Auto ECG.
The printout will consist of a 12 lead formatted ECG. Verify the following:
 - Correct printing of the lead waveforms.
 - Stat ID number entered in the ID field.
 - Correct date and time when the ECG was acquired.
 - Interpretation indicates Normal ECG.
13. Press the **HOME** key.
14. Press the **DIRECTORY** key to verify the ECG is saved in the patient directory.
15. Press the **HOME** key.
16. Disconnect the patient simulator.

Calibration Pulse Check Procedure

To perform the calibration pulse check (if necessary, refer to the *Operating Instructions*), apply a cal pulse individually to Leads I, II, and V1-V6 (C1-C6) and verify they reproduce a 1 mV signal referred to input within a tolerance of +/- 5%.

This can be accomplished by one of the following methods:

- ◆ Using a Calibrated ECG simulator with a 1 mV CAL pulse with rise time of not greater than 5mS.

Verify each lead by connecting the lead to be tested to the input of the appropriate cal pulse connector while all other leads are connected to their appropriate connection points.

- ◆ Using AAMI EC11 Fig. 3 test circuits with a calibrated source:
 - a. Create 1 mV Cal pulse by setting the signal source in Fig. 3 to 1 volt +/- 1% with a rise time no greater than 5mS and ensure S5 is open while S1 and S2 are closed. Also ensure S3 is set to position “a”.
 - b. Verify each lead by connecting the lead to be tested to the P1 input of the test circuit while all other leads are connected to P2.

Electrical Leakage Current Tests

Use these tests to verify Atria electrical safety. All leakage tests must be performed after any internal repair (i.e., the case is opened), or to check for possible damage (e.g., the Atria is dropped).

Required Equipment

- ◆ Dynatech Nevada 235A Safety Analyzer

Note: The Dynatech Safety Analyzer is recommended for this procedure, if a different safety analyzer is used, consult the user manual for proper setup and testing procedures.

Patient Leakage Current Procedure

Note: Ensure that the Kelvin cable is not connected.

1. Plug the safety analyzer into the 264 VAC line voltage.
2. Plug the Atria power cable into the test receptacle on top of the safety analyzer.
3. Connect a patient cable between patient input connector on the Atria and the appropriate patient terminals on the top of the safety analyzer.
4. Press the **ENABLE** button for the **ECG LEADS** group on the safety analyzer.
5. Turn the **SELECT** knob to select **ALL**.
6. Verify the leakage current is less than 10 μ A for these conditions:
 - Polarity Normal, Atria power on
 - Polarity Normal, Open Ground, Atria power on
 - Polarity Normal, Open Neutral, Atria power on
 - Polarity Reversed, Atria power on
 - Polarity Reversed, Open Ground, Atria power on
 - Polarity Reversed, Open Neutral, Atria power on

Patient Sink Current Procedure



WARNING! Shock hazard.

This test applies AC Line Voltage to the patient cable.

Note: Ensure that the Kelvin cable is not connected.

1. Turn the **SELECT** knob to select **ISOLATION** in the **ECG LEADS** group and wait for the numbers to display.
2. Press the **ISO TEST** button and verify that the highest measured value is less than 50 μ A.

Queue Sensor Calibration

Used to measure and record queue sensor voltages based on queue sensor characteristics and internal physical alignment. Required for the following conditions:

- ◆ The paper tray assembly is removed or replaced
- ◆ The queue sensor board is replaced
- ◆ The power supply board is replaced
- ◆ The mainboard is replaced

Note: This procedure is not required if the paper door is replaced or after minor adjustments.

If this calibration fails twice, contact Technical Support.

Calibration Procedure



Caution: Equipment damage.

Use only Assurance[®] or Heartline[™] standard paper. Using any other paper may damage the Atria and void the warranty.

1. Insert paper into the paper drive so that the print head is approximately half-way between the perforations of the paper.
2. Power on the Atria and verify the ECG screen is displayed (press the **HOME** key).
3. Select **Setup | Service Functions | Queue Sensor Calibration** and press the **ENTER** key.
4. Press **HOME**.
5. Press the **FORM FEED** key and verify the paper queues correctly.
6. Select **Setup | Waveform Preferences | Speed | 12.5mm/s**.
7. Press the **MANUAL RHYTHM** key and print 3 pages of ECG data.
Verify additional headers are not printed on the pages.
8. Press **STOP**.
Verify the paper queues correctly.
9. Select **AUTO RHYTHM**.
Verify a one page report prints and the paper correctly queues.
10. Repeat for waveform speeds of 25 mm/s and 50 mm/s.

3 Troubleshooting

What's in this chapter

- ◆ Preliminary Checks 3-1
- ◆ Troubleshooting Chart 3-2

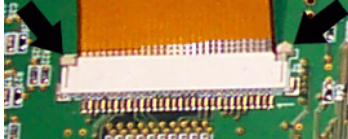
Preliminary Checks

Before using the troubleshooting chart below, check the following:

1. Ensure users are correctly following instructions listed in the *Operating Instructions*. Verify proper skin preparation, lead placement, lead integrity, etc.
2. Check the Atria settings (**Setup | Print Setup Report**) to ensure the Atria is configured as expected.
3. Verify external cables are undamaged and securely connected. Swap out the power cable, external transformer, and patient cable with known good cables.
4. Check for any other visible damage such as cracks in the case, broken or cracked cable connectors, or rattling when the Atria is moved.

Troubleshooting Chart

Problem	Solution
Artifacts or noise on ECG trace	<p>Check the following for general problems (refer to the <i>Operating Instructions</i> Troubleshooting section for specific problems and solutions):</p> <ul style="list-style-type: none">• Try to prevent unnecessary patient movement.• Ensure all leads are clean, secure, and properly placed.• Ensure the skin is properly prepared and unbroken.• Ensure all cables are securely connected.• Check cables for damage, including nicks, cuts, wear, or bulging.• Position the Atria as far from other electronic equipment as possible.
Message <i>Waiting for Data</i> is displayed	<p>This message is normally displayed for about 15 seconds after beginning an ECG acquisition. If it does not go away after about 15 seconds:</p> <ul style="list-style-type: none">• Check the screen for a lead fail indication, and then fix that lead.• Check all the ECG leads.• Troubleshoot for noise (see Artifacts or noise on ECG trace).• Refer to the <i>Operating Instructions</i> for additional troubleshooting information.
AC power indicator is off (Green LED on back panel)	<ul style="list-style-type: none">• Ensure both ends of the power cord are securely connected.• Ensure green LED on external power supply is on.• Ensure the power outlet is working.• Replace power cord.• Replace the external power supply. <hr/> <p>These solutions must be performed by qualified service personnel:</p> <ul style="list-style-type: none">• Replace power supply board.
Atria unexpectedly reboots (crashes)	<p>The Atria will shut off if both AC and battery power are interrupted at the same time. The Atria must have a battery installed during normal operation.</p> <ul style="list-style-type: none">• If operating from the battery, ensure the battery is charged and the cable securely connected.• If operating from AC power, ensure the battery is installed and AC power is available• After a crash, insert a USB flash drive and select Setup Service Functions Copy crash dump to USB. A text file is created that can be sent to Technical Support for analysis.

Problem	Solution
<p>Video Display</p> <ul style="list-style-type: none"> No display Display is too dark or too light Display is unstable 	<ul style="list-style-type: none"> Ensure a battery is installed and check the green power LED on the back panel to verify AC power is available. Try adjusting the brightness (SHIFT + NEXT or SHIFT + PREVIOUS). Press and hold the ON/STBY key for 8 seconds to power off and then press ON/STBY again to restart the Atria.
<p>These solutions must be performed by qualified service personnel:</p>	
<ul style="list-style-type: none"> Ensure keyboard cable is securely connected. Atria 6100 only: Ensure the display and backlight cables are securely connected. The graphic below shows the Video Display cable improperly connected--the cable is not fully inserted into the jack and the right tab is not fully engaged to lock in the cable. 	
	
<p>Figure 2: Incorrect Video Cable Installation</p>	
<ul style="list-style-type: none"> Replace the top cover assembly. Replace the power supply board. Replace the mainboard. 	
<p>Keyboard</p> <ul style="list-style-type: none"> No response from one or more keys Key sticks 	<p>Select Setup Service Functions Keyboard Test to verify keyboard operation.</p> <ul style="list-style-type: none"> If ON/STBY key does not work, ensure the battery is installed and check the green power LED on the back panel to verify AC power is available. Restart the Atria. Clean the outside surface keyboard with isopropyl alcohol.
<p>These solutions must be performed by qualified service personnel:</p>	
<ul style="list-style-type: none"> Verify the keyboard cable is securely connected. Clean the underside of the keypad and the keypad contacts with isopropyl alcohol. Replace the keyboard cable. Replace the top cover assembly. Replace the mainboard. 	

Problem**Solution**

Printing

- Paper does not feed
- Paper feeds but does not print
- Printing too light or too dark
- Out of Paper message in error

Select **Setup | Service Functions | Printer Test Sequence** to verify printer operation.

- Ensure Burdick paper is used (Assurance® or Heartline™).
- Verify paper type in **System Settings** matches the paper installed.
- Check paper door gear for damage and then ensure paper door is properly seated.
- Take paper out and reinstall. Follow paper installation instructions in the *Operating Instructions*.
- Clean queue sensor. See illustration below. Paper dust may collect on the sensor--clean the queue sensor by wiping with a soft cloth.

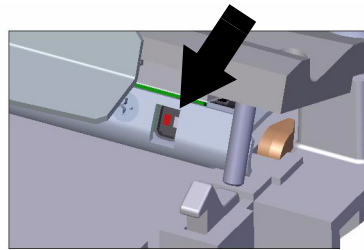


Figure 3: Queue sensor

These solutions must be performed by qualified service personnel:

- Verify the printhead resistance entered (**Setup | Service Functions | Printhead Resistance**) matches the resistance entered on the printhead.
- Ensure cables from the paper tray assembly to the power supply board are securely connected.
- Replace cables from the paper tray assembly to the power supply board.
- Replace queue sensor.
- Replace paper tray assembly.
- Replace power supply board.

Problem	Solution
<p>Battery</p> <p>Atria will not operate when disconnected from AC power or only operates for a short time.</p>	<p>Normal battery life is about 3 hours depending on how the Atria is used (if the battery lasts less than half that time or is more than two or three years old, it should be replaced). To conserve Battery life, do not turn on the Atria until the patient is prepared and the leads are connected.</p> <ul style="list-style-type: none"> • Ensure green LED on external power supply is on. • Check the green power LED on the back panel to verify power is available when charging the battery. • Ensure the battery is installed and the battery cable is securely connected. • Ensure the battery has been charged for at least four hours. • If the Atria has not been used for an extended period (several months), the battery may be fully discharged and will only accept a minimal charge. Try disconnecting AC power and then charge the battery again. <hr/> <p>These solutions must be performed by qualified service personnel:</p> <ul style="list-style-type: none"> • Replace the battery. • Replace the power supply board.
<p>Additional patients cannot be added to the patient directory</p>	<p>Normally, when the directory reaches the maximum number of patients, the oldest records will be deleted as new records are added. However, this only happens if the records have been printed or sent. If none of the records have been printed or sent, additional patients cannot be added to the directory.</p> <ul style="list-style-type: none"> • Print or send old records.
<p>Date and time inconsistent or cannot be set</p>	<p>These solutions must be performed by qualified service personnel:</p> <ul style="list-style-type: none"> • Replace 3V button cell on mainboard • Replace mainboard assembly
<p>Communications Errors</p>	<p>See the <i>Communications Troubleshooting Help</i> pages (ALT + H) for a list of specific errors. General checks include:</p> <ul style="list-style-type: none"> • Ensure the serial, phone, network, or USB cables are securely connected to the correct jack. • Check the communications settings. • For network problems, check with the network administrator to ensure the destination is available (to display the IP Address of the Atria, select Setup Service Functions Get IP Address).

4 Component Replacement

What's in this chapter

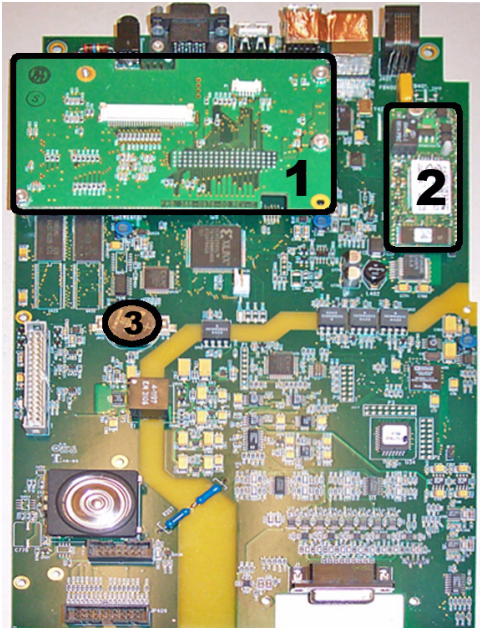
- ◆ Parts List 4-1
- ◆ Component Replacement 4-6
- ◆ Disassembly 4-12

This section contains instructions for removing, ordering, and replacing the *Atria* subassemblies.

Parts List

To locate components, refer to *Disassembly* on page 4-12 and to this parts list:

Part	Description and Location	Part #
	Mainboard	671-1299-00
	1. Video Adapter Board (Atria 6100 only)	671-1301-00
	2. Modem (w/ nylon standoff)	671-0001-00
	3. Battery, CR2032	146-0052-00
	Note: Mainboard includes CR2032 Battery.	
	Atria 6100: The video adapter board and modem must be ordered separately.	



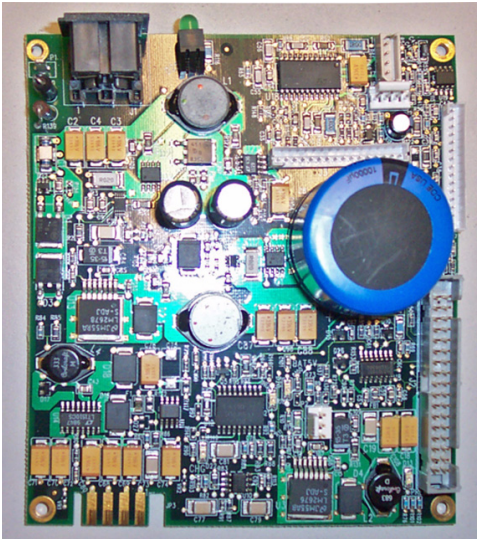
Part

Description and Location

Part #

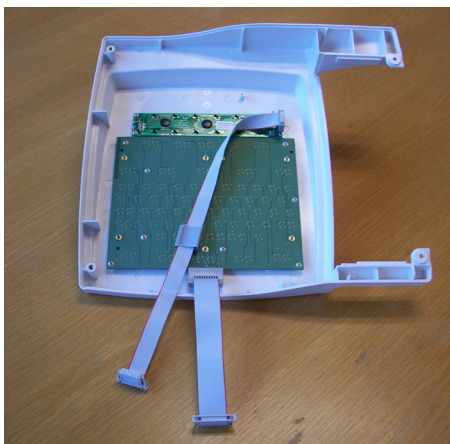
Power Supply Board

671-1300-01



Atria 3100 Top Cover Assembly

651-1503-01



Part	Description and Location	Part #
	Atria 6100 Top Cover Assembly (with Video Display)	651-1429-00
	Atria 6100 Top Cover Assembly (without Video Display)	651-0002-00
	Paper Tray Assembly	10-00040-01S
Paper Tray Assembly	Queue Sensor	30-00005-01S
	Queue Sensor	

Part	Description and Location	Part #
	Paper Door	10-00041-01S
	Atria 3100 Battery Access Cover	671-0003-01
	Atria 6100 Battery Access Cover	671-0002-01
	Atria 3100 Battery Pack, 14.4V, NiMH, 1500mAH	146-0131-00
	Atria 3100 Battery Pack, Ferrite for the power brick.	276-0280-00
	Atria 6100 Battery Pack, 14.4V, NiMH, High Capacity	146-0127-00
	Mainboard to Power Supply Board Cable	175-1607-00

Part	Description and Location	Part #
	Atria 3100 Keyboard with Card Edge Connector	60-00040-01
	Atria 3100 LCD 14 pin Ribbon Cable	60-00041-01
	Atria 6100 Keyboard Cable	60-00039-01
Not Pictured	Plastite Screw (4 x 5/16) Note: Do not use non-Plastite screws. Other types of screws may damage the case.	211-0466-00
Not Pictured	Screw (M4 X 0.7 X 8)	215-0223-00
Not Pictured	External Power Supply (Brick)	010-1684-00
Not Pictured	Screw M3 x 6	701950
Not Pictured	Screw 6-32x3/8 Pan PH	50-00046-01
Not Pictured	Screw 6-32x1/4 Flat (100°) PH	50-00045-01
Not Pictured	Screw M4x16 Pan PH	017439-065
Not Pictured	Screw 4-40x3/19 Flat (100°) PH	50-00047-01

Component Replacement



WARNING! Shock hazard.

Before opening the case, ensure the Atria is unplugged and the battery pack is removed. If power must be applied while the case is open, ensure all personnel and equipment are clear of any energized components.



Caution: Static electricity.

Several Atria components are extremely sensitive to static electricity. Always use an anti-static mat and wrist grounding strap when working on internal components.



Caution: Burn hazard.

Components inside the unit may be hot after use. Use caution when working on internal components.

The following section lists the steps to replace each Atria component.

Replace the Top Cover Assembly

The top cover assembly includes the top cover (with labels for either Burdick or Quinton), keyboard assembly, and the video display.

Note: For the Atria 6100: The top cover assembly may be ordered without a video display.

1. Remove the battery pack (see [Remove the Battery Pack](#) on page 4-12).
2. Remove the top cover assembly (see [Remove the Atria 3100 Top Cover Assembly](#) on page 4-14 or [Remove the Atria 6100 Top Cover Assembly](#) on page 4-15).
3. For the Atria 6100:
 - a. Remove the paper drive assembly (see [Remove the Paper Drive Assembly](#) on page 4-17).
 - b. Disconnect the video display cables (see [Figure 5 on page 4-20](#), a and b).
 - c. Connect the new video display cables.
 - d. Re-install the paper drive assembly.
4. Install the new top cover assembly.
5. Re-install the battery pack.
6. Apply the Burdick or Quinton label (the new label must be the same as the label on the old top cover).
7. Perform the following tests before returning the Atria to service:
 - [Functional Checkout](#) on page 2-2
 - [Electrical Leakage Current Tests](#) on page 2-4
 - [Queue Sensor Calibration](#) on page 2-6

Replace the Paper Drive Assembly

1. Remove the battery pack (see [Remove the Battery Pack](#) on page 4-12).
2. Remove the top cover assembly (see [Remove the Atria 3100 Top Cover Assembly](#) on page 4-14 or [Remove the Atria 6100 Top Cover Assembly](#) on page 4-15).
3. Remove the paper drive assembly (see [Remove the Paper Drive Assembly](#) on page 4-17).
4. Install the new paper drive assembly.
Note: Ensure the cables to the power supply board stay securely connected while installing the paper drive assembly.
5. Write the printhead resistance (written on the top of the printhead) onto the printhead resistance label.
6. Attach the printhead resistance label onto the enclosure bottom in the battery compartment.
7. Re-install the top cover assembly.
8. Re-install the battery pack.
9. Perform the following tests before returning the Atria to service:
 - [Functional Checkout](#) on page 2-2
 - [Electrical Leakage Current Tests](#) on page 2-4
 - [Queue Sensor Calibration](#) on page 2-6

Replace the Atria 3100 Mainboard (including Modem)

If the modem must be replaced, disassembly is the same to the mainboard.

1. Remove the battery pack (see *Remove the Battery Pack* on page 4-12).
2. Remove the top cover assembly (see *Remove the Atria 3100 Top Cover Assembly* on page 4-14).
3. Remove the paper drive assembly, (see *Remove the Paper Drive Assembly* on page 4-17).
4. Remove the modem, if not replacing, and then the mainboard (see *Remove Atria 3100 Mainboard Assembly* on page 4-18).
5. Install the new mainboard.
6. Re-install the modem.
7. Re-install the paper drive assembly.

Note: Ensure the cables to the power supply board stay securely connected while installing the paper drive assembly.

8. Re-install the top cover assembly.
9. Re-install the battery pack.
10. Perform the following tests before returning the Atria to service:
 - *Functional Checkout* on page 2-2
 - *Electrical Leakage Current Tests* on page 2-4
 - *Queue Sensor Calibration* on page 2-6

Replace the Atria 6100 Mainboard (including Video Adapter Board and Modem)

The mainboard includes the CR2032 battery, but not the video adapter board or the modem.

If the video adapter board or modem must be replaced, disassembly is the same to the mainboard, except do not disconnect the video display cables to replace the modem.

1. Remove the battery pack (see [Remove the Battery Pack](#) on page 4-12).
2. Remove the top cover assembly (see [Remove the Atria 6100 Top Cover Assembly](#) on page 4-15).
3. Remove the paper drive assembly (see [Remove the Paper Drive Assembly](#) on page 4-17).
4. Remove the video adapter board, modem and then the mainboard (see [Remove Atria 6100 Mainboard Assembly](#) on page 4-20).
5. Install the new mainboard.
6. Re-install the video adapter board.
7. Re-install the modem.
8. Re-install the paper drive assembly.

Note: Ensure the cables to the power supply board stay securely connected while installing the paper drive assembly.

9. Re-install the top cover assembly.
10. Re-install the battery pack.
11. Perform the following tests before returning the Atria to service:
 - [Functional Checkout](#) on page 2-2
 - [Electrical Leakage Current Tests](#) on page 2-4
 - [Queue Sensor Calibration](#) on page 2-6

Replace the Power Supply Board

1. Remove the battery pack (see [Remove the Battery Pack](#) on page 4-12).
2. Remove the top cover assembly (see [Remove the Atria 3100 Top Cover Assembly](#) on page 4-14 or [Remove the Atria 6100 Top Cover Assembly](#) on page 4-15).
3. Remove the paper drive assembly (see [Remove the Paper Drive Assembly](#) on page 4-17).
4. Remove the power supply board (see [Remove Power Supply Board](#) on page 4-22).
5. Replace the power supply board.

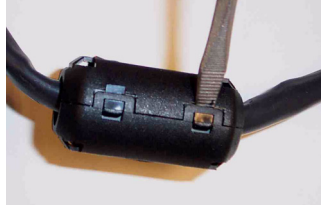
Note: A rubber spacer must be installed under the screw hole near P1 (see the board detail on [Figure 7 on page 4-22](#)). Ensure the other rubber spacer to the right of P1 is left intact. The spacer may adhere to the power supply board or bottom assembly when the board is removed and is easily lost. When reinstalling the power supply board, ensure the spacer is in place to prevent the board from warping when the screw is tightened.

6. Re-install the paper drive assembly.

Note: Ensure the cables to the power supply board stay securely connected while installing the paper drive assembly.
7. Re-install the top cover assembly.
8. Re-install the battery pack.
9. Perform the following tests before returning the Atria to service:
 - [Functional Checkout](#) on page 2-2
 - [Electrical Leakage Current Tests](#) on page 2-4
 - [Queue Sensor Calibration](#) on page 2-6

Replace the External Power Supply

1. Power down the Atria and disconnect external power.
2. Remove the ferrite from the old external power supply cable by unsnapping fasteners.



3. Place the ferrite around the new power supply cable 2 inches (+/- 1/2 inch), from the 5 pin din connector.



4. Re-install the power supply cable.

Disassembly

The procedures in this section detail removing Atria components.

Remove the Battery Pack



WARNING! Fire, explosion, or contamination hazard.

Properly dispose of batteries in accordance with local regulations. Burning, heating, or improper disposal may cause explosion, fire, or contamination.



Caution: Loss of data.

The battery pack must be installed at all times for proper operation. Operating without a battery pack may result in lost or unsaved waveform data.



Caution: Patient injury.

Do not remove the battery pack within the patient vicinity.

1. Disconnect external power.



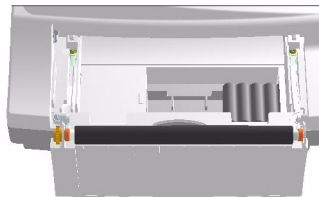
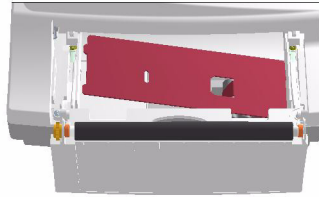
WARNING! Shock hazard.

Verify the external power cord is disconnected before removing or replacing battery pack. A blank display is not a reliable indication of disconnected external power.

2. Pull out the paper door and remove the paper.



3. Remove the battery access cover.
 - a. Slide the plate toward the front of the Atria.
 - b. Lift up the back end of the plate to remove.



4. Remove battery pack:
 - a. Slide the battery pack out of the battery compartment.



Caution: Equipment damage.

Do not pull on the wires to disconnect the battery pack connector. This may cause the connector to fail. Only pull on the connector to disconnect the battery pack.

- b. Disconnect the battery pack connector.
5. For the Atria 3100 only:
 - a. Remove the ferrite from the old battery pack by unsnapping fasteners.



- b. Place the ferrite around the new battery pack cable approximately in the middle of the cable.

Remove the Atria 3100 Top Cover Assembly

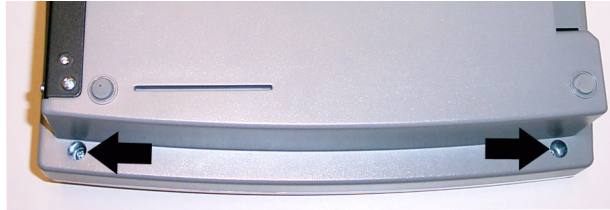


Caution: Burn hazard.

Components inside the unit may be hot after use. Use caution when working on internal components.

To remove the top cover assembly:

1. Turn the electrocardiograph over and remove the two bottom assembly screws.



2. Carefully turn the electrocardiograph back over.
3. Remove the paper door and the paper, (see [Remove the Paper Door](#) on page 4-23).
4. Remove the two screws and the paper door rails from the paper well.



5. Lift the top cover assembly and disconnect the keyboard cable and the video cable.

Remove the Atria 6100 Top Cover Assembly

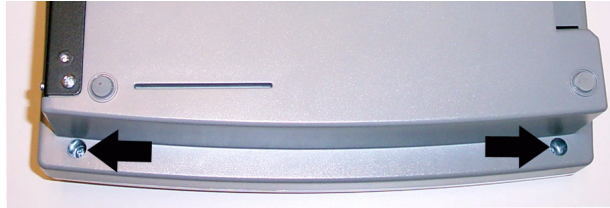


Caution: Burn hazard.

Components inside the unit may be hot after use. Use caution when working on internal components.

To remove the top cover assembly:

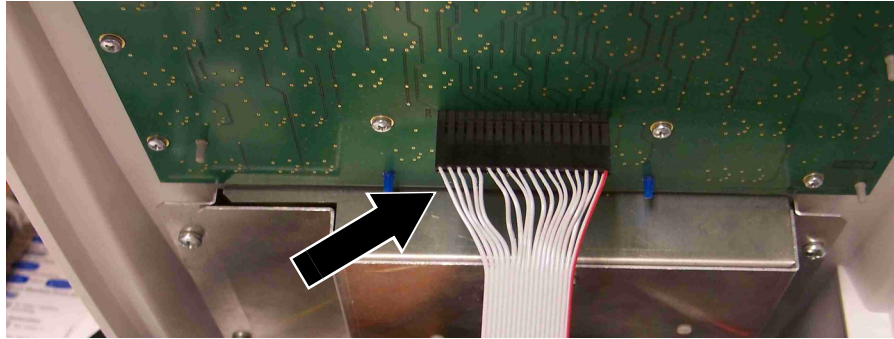
1. Turn the electrocardiograph over and remove the two bottom assembly screws.



2. Carefully turn the electrocardiograph back over.
3. Remove the paper door and the paper, (see [Remove the Paper Door](#) on page 4-23).
4. Remove the two screws and the paper door rails from the paper well.



5. Lift the top cover assembly and disconnect the keyboard cable.

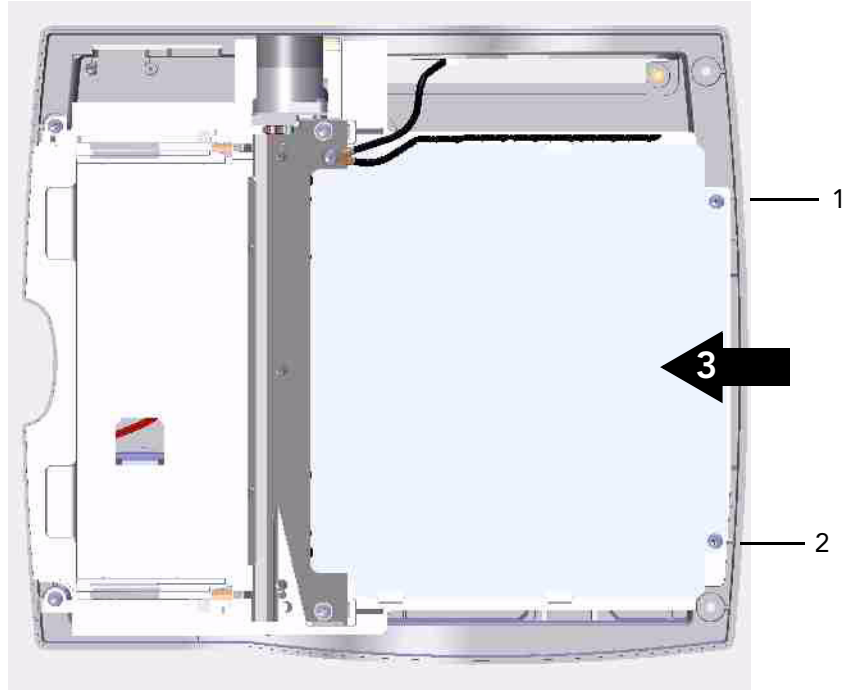


6. Remove the top cover assembly and set upright behind the Atria.
Note: The two video display cables will still be connected.

Remove the Paper Drive Assembly

To remove the paper drive assembly:

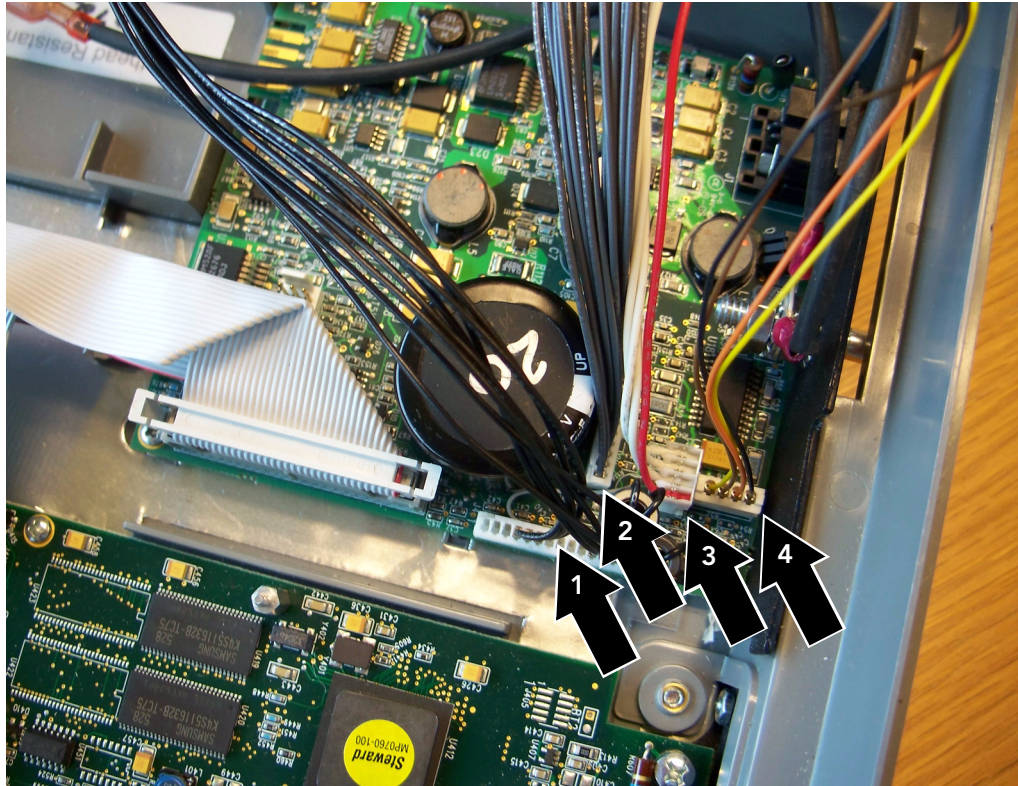
1. Remove the printer assembly screws (1 and 2).



2. Lift out the paper drive assembly and rotate clockwise 180° to set aside.

Note: When reinstalling the paper drive assembly, be sure to push the paper cover fully to the position pins on the print head bracket (3) before tightening the screw.

Note: The paper drive assembly power cables remain connected to the power supply board.



3. Disconnect the cable connectors from J3 (2), J4 (1), J6 (3), and J7 (4) on the power supply board.

Remove Atria 3100 Mainboard Assembly

The mainboard assembly includes an optional modem board (B).

Note: The modem is connected to the mainboard with four multi-pin connectors (one in each corner) and a nylon standoff.

When removing the modem, the standoff may need to be clipped for easier removal (a new standoff is included with a new modem or new mainboard). When installing the modem, check for bent pins and seat the modem carefully ensure all the pins line up.

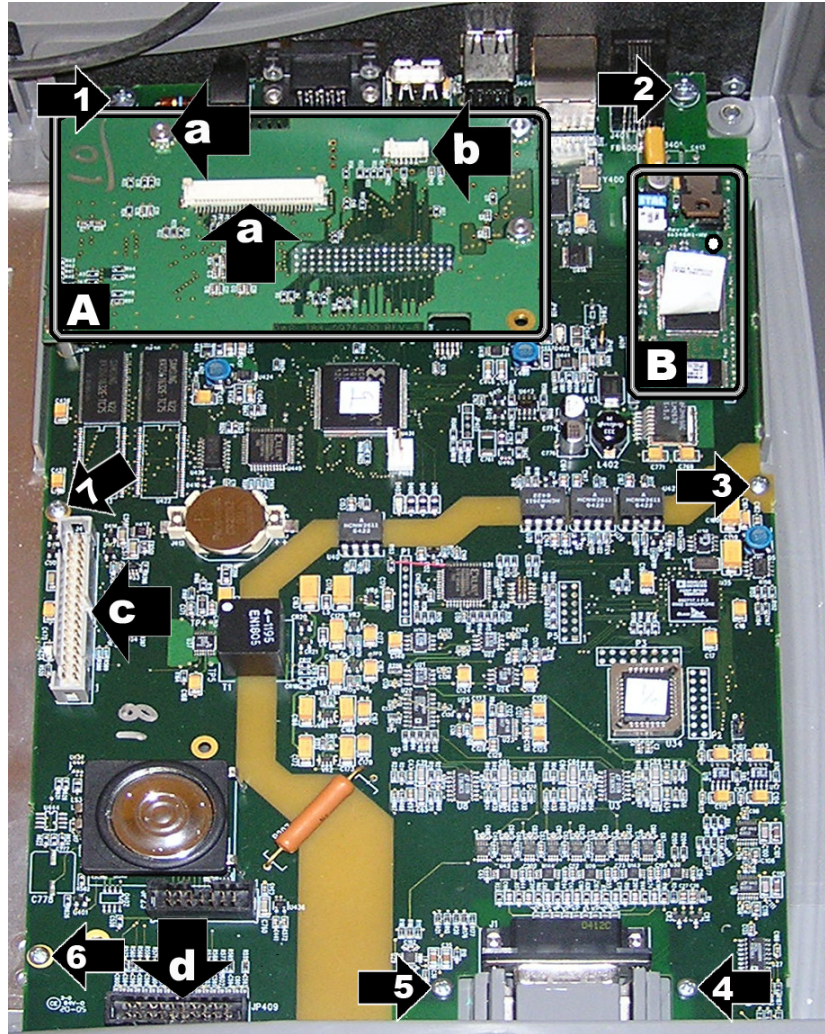


Figure 4: Mainboard Removal

1. Disconnect the keyboard cable connector from JP409 (labeled d in [Figure 4](#)).
2. Disconnect the power supply board cable from J412 (c).
3. Disconnect the LCD Display cable from JP23 located just above the keyboard connector JP409.

Remove Atria 6100 Mainboard Assembly

The mainboard assembly includes the video adapter board (A, in the figure below) and an optional modem board (B).

Note: The modem is connected to the mainboard with four multi-pin connectors (one in each corner) and a nylon standoff.

When removing the modem, the standoff may need to be clipped for easier removal (a new standoff is included with a new modem or new mainboard). When installing the modem, check for bent pins and seat the modem carefully ensure all the pins line up.

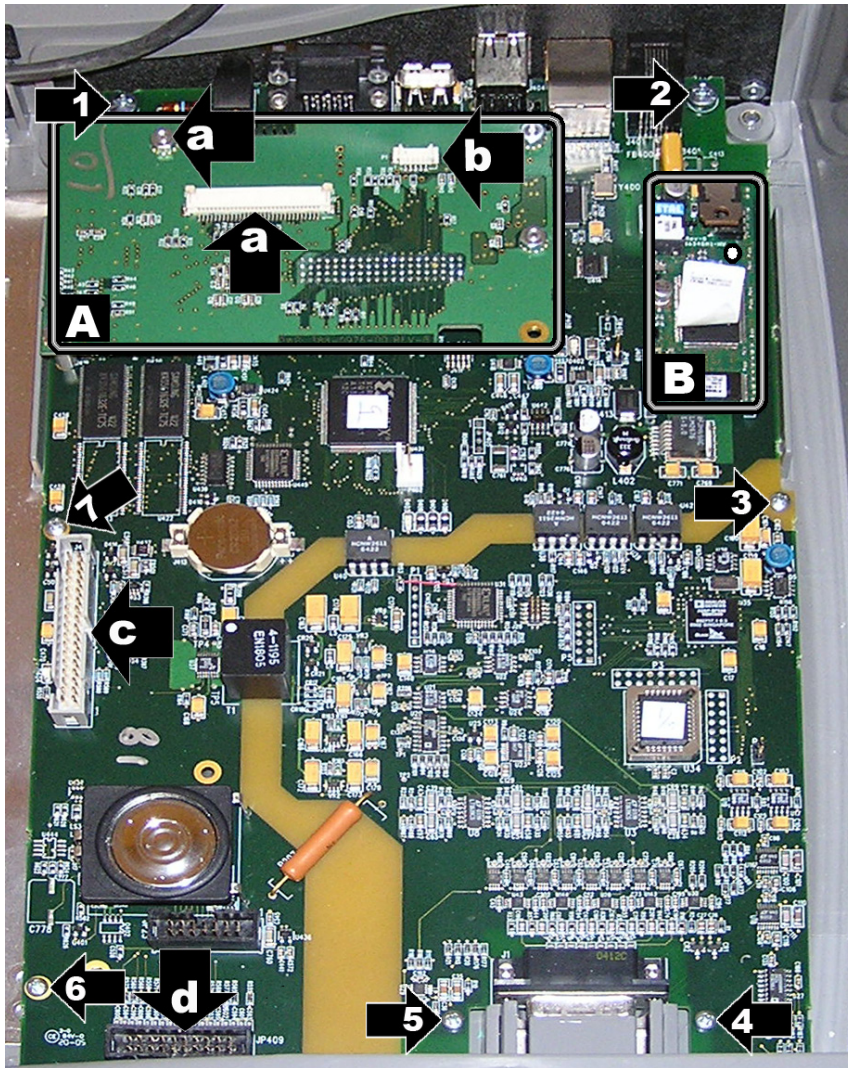


Figure 5: Mainboard Removal

1. Disconnect the keyboard cable connector from JP409 (labeled d in [Figure 5](#)).
2. Disconnect the power supply board cable from J412 (c).
3. Disconnect the video display cable and ground (a) and backlight cable (b) from the video adapter board connectors.

Note: When reinstalling the video cable, ensure the connector is fully inserted and the side clips are completely engaged. The figure below shows an incorrectly installed cable:

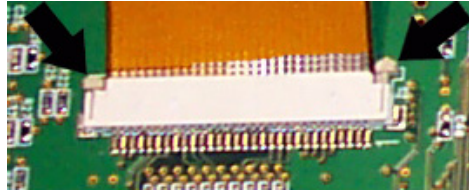


Figure 6: Incorrect Video Cable Installation

4. Remove the 7 screws (labeled 1-7 with black arrows on [Figure 5](#)).

Remove Power Supply Board

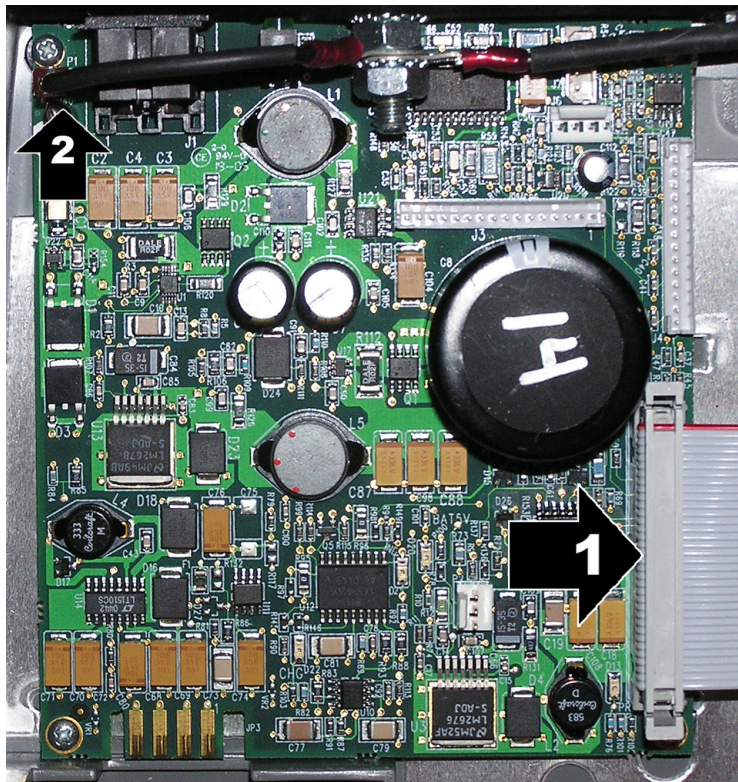


Figure 7: Power supply board removal

1. Disconnect the ground connector to P1 (2).
2. Disconnect the cable to the mainboard (1).
3. Remove the 4 screws (one in each corner).

Note: A rubber spacer must be installed under the screw hole near P1 (see the board detail on [Figure 8](#)). Ensure the other rubber spacer to the right of P1 is left intact. The spacer may adhere to the power supply board or bottom assembly when the board is removed and is easily lost. When reinstalling the power supply board, ensure the spacer is in place to prevent the board from warping when the screw is tightened.

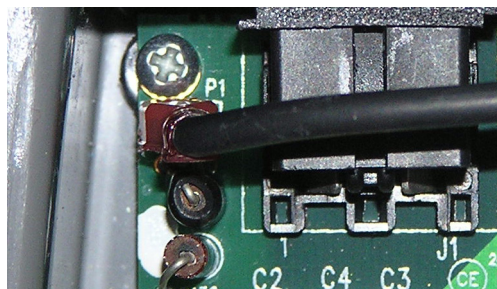
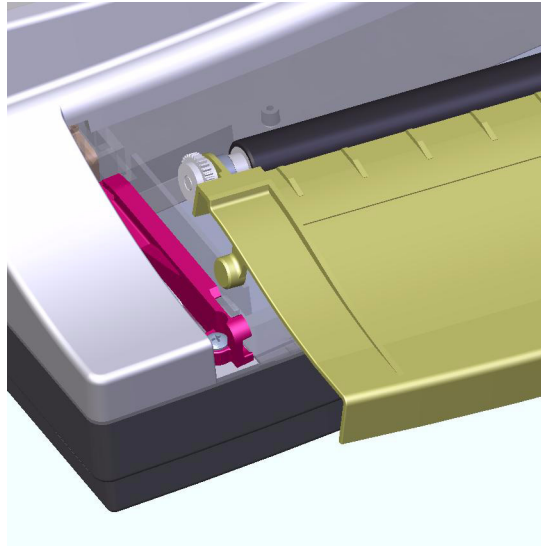


Figure 8: Power supply board detail

Remove the Paper Door

To remove the paper door:

- ◆ Pull the door out and lift the door through the side rail at the back of the unit.



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